SOMMERKAMP TS740 SSB 40 CANALI AM-SSB CTE 747 40 CANALI

CONTROLS AND INDICATORS

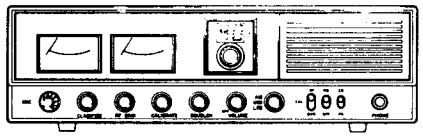


Fig. 2 Front Panel

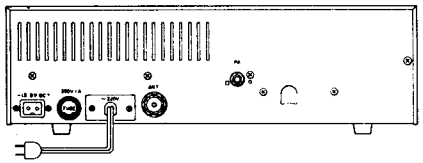


Fig. 3 Rear Panel

DESCRIZIONE DEL CIRCUITO ELETTRICO

CIRCUIT DESCRIPTION

Your TS-740SSB is an SSB/AM transceiver that employs the most advanced circuitry, PLL (Phase Lock Loop) Frequency Synthesizing circuit which obviates expensive crystals in great numbers but operates with a great reliability. The circuit theory is somewhat complicated but will be given below in a simple manner for your understanding of the new technology employed in your transceiver.

FUNDAMENTAL THEORY OF PLL CIRCUITRY

The word PLL is an abbreviation of the "Phase Loocked Loop" in which a given signal is processed to track the frequency and phase of a reference signal.
In other word, the PLL is an automatic frequency control loop with automatic phase control.
The PLL circuitry consists of the three main units in simple form as shown in Fig. 4.

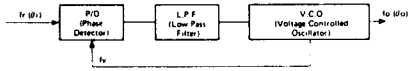


Fig. 4 PLL CIRCUIT

In the above block diagram, when the reference frequency fr and the VCO output frequency fv to be compared are applied to the Phase Detector P/D, fv is compared with fr in terms of phase lag and lead.
Then the resulting output (phase difference) is converted into the DC output voltage corresponding to the phase difference. Since the phase comparation is made at every cycle, the DC output is then led to the low pass filter (L.P.F.) and integrated or smoothed to continuous DC voltage in proportion to the phase difference. The frequency of voltage controlled oscillator (V.C.O.) is controlled by the L.P.F. output voltage. Thus controlled VCO output is then split into two: One used as a operating frequency of the unit and another will be returned to the P/D, making a closed loop. The closed loop will continue to operate until the following condition is met;

$$\theta r(t) = \theta o(t)$$

This condition is called locked.
Employing the PLL system into a CB transceiver requires some modifications so that the VCO generates specific frequency corresponding to each channel frequency [1–40] according to the channel selection. Fig. 5 is the new block diagram made with this modification. As you can see, a programmable divider, mixer and offset oscillator are newly added.

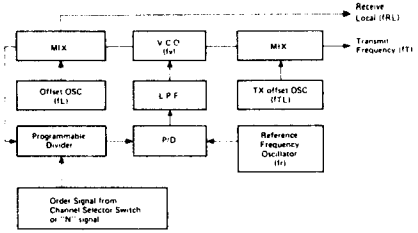


Fig. 5 BLOCK DIAGRAM OF PLL

In Fig. 5, the first local oscillator frequency for reception fRL is given below

$$fRL = fL + fv \quad \cdots\cdots\cdots (1)$$

$$fv = fL - (N \times fr) \quad \cdots\cdots\cdots (2)$$

The transmit frequency fT is

$$fT = fRL - fTL \quad \cdots\cdots\cdots (3)$$

$$= fL + fv - fTL \quad \cdots\cdots\cdots (4)$$

Where "N" is an order signal from the channel selector switch. When using the system in the transceiver, fr should have the same frequency as the channel spacing, namely, fr = 10 kHz. When receiving channel No. 1, 26.965 MHz, the first local frequency fRL should be,

$$fRL = 26.965 + 10.695 = 37.660 \text{ MHz}$$

The V.C.O frequency fv is

$$fv = fRL - fL = 37.660 - 20.105 = 17.555 \text{ MHz}$$

Then, N code will be obtained by using equation 2

$$N = \frac{fL - fv}{fv} = \frac{20.105 - 17.555}{0.01} = 255$$

This means that selecting the channel No. 1 is to select one of "N" codes (ie 255) instead of selecting a proper crystals in a conventional CB transceiver. Thus varying "N" numbers and selecting one of them, any channel can be selected. This is the major difference between a conventional crystal type and PLL Frequency Synthesizer type transceiver.

Fig. 6 is a practical operation block diagram of PLL section.

CARTA DEI CODICI

FREQUENCY AND CODE CHART FOR AM/SSB TRANSCEIVER

Channel No.	Channel Freq. (MHz)	"N" Digital Code	VCO Freq. (MHz)		Channel Sw. Output						RX 1st Local Freq. (MHz)	
			AM/USB	LSB	P0	P1	P2	P3	P4	P5	AM/USB	LSB
1	26.965	255	17.555	17.5535	1	1	1	1	1	1	37.66	37.657
2	26.975	254	17.565	17.5635	0	1	1	1	1	1	37.67	37.667
3	26.985	253	17.575	17.5735	1	0	1	1	1	1	37.68	37.677
4	27.005	251	17.595	17.5935	1	1	0	1	1	1	37.70	37.697
5	27.015	250	17.605	17.6035	0	1	0	1	1	1	37.71	37.707
6	27.025	249	17.615	17.6135	1	0	0	1	1	1	37.72	37.717
7	27.035	248	17.625	17.6235	0	0	0	1	1	1	37.73	37.727
8	27.055	246	17.645	17.6435	0	1	1	0	1	1	37.75	37.747
9	27.065	245	17.655	17.6535	1	0	1	0	1	1	37.76	37.757
10	27.075	244	17.665	17.6635	0	0	1	0	1	1	37.77	37.767
11	27.085	243	17.675	17.6735	1	1	0	0	1	1	37.78	37.777
12	27.105	241	17.695	17.6935	1	0	0	0	1	1	37.80	37.797
13	27.115	240	17.705	17.7035	0	0	0	0	1	1	37.81	37.807
14	27.125	239	17.715	17.7135	1	1	1	1	0	1	37.82	37.817
15	27.135	238	17.725	17.7235	0	1	1	1	0	1	37.83	37.827
16	27.155	236	17.745	17.7435	0	0	1	1	0	1	37.85	37.847
17	27.165	235	17.755	17.7535	1	1	0	1	0	1	37.86	37.857
18	27.175	234	17.765	17.7635	0	1	0	1	0	1	37.87	37.867
19	27.185	233	17.775	17.7735	1	0	0	1	0	1	37.88	37.877
20	27.205	231	17.795	17.7935	1	1	1	0	0	1	37.90	37.897
21	27.215	230	17.805	17.8035	0	1	1	0	0	1	37.91	37.907
22	27.225	229	17.815	17.8135	1	0	1	0	0	1	37.92	37.917
23	27.255	226	17.845	17.8435	0	1	0	0	0	1	37.95	37.947
24	27.235	228	17.825	17.8235	0	0	1	0	0	1	37.93	37.927
25	27.245	227	17.835	17.8335	1	1	0	0	0	1	37.94	37.937
26	27.265	225	17.855	17.8535	1	0	0	0	0	1	37.96	37.957
27	27.275	224	17.865	17.8635	0	0	0	0	0	1	37.97	37.967
28	27.285	223	17.875	17.8735	1	1	1	1	1	0	37.98	37.977
29	27.295	222	17.885	17.8835	0	1	1	1	1	0	37.99	37.987
30	27.305	221	17.895	17.8935	1	0	1	1	1	0	38.00	37.997
31	27.315	220	17.905	17.9035	0	0	1	1	1	0	38.01	38.007
32	27.325	219	17.915	17.9135	1	1	0	1	1	0	38.02	38.017
33	27.335	218	17.925	17.9235	0	1	0	1	1	0	38.03	38.027
34	27.345	217	17.935	17.9335	1	0	0	1	1	0	38.04	38.037
35	27.355	216	17.945	17.9435	0	0	0	1	1	0	38.05	38.047
36	27.365	215	17.955	17.9535	1	1	1	0	1	0	38.06	38.057
37	27.375	214	17.965	17.9635	0	1	1	0	1	0	38.07	38.067
38	27.385	213	17.975	17.9735	1	0	1	0	1	0	38.08	38.077
39	27.395	212	17.985	17.9835	0	0	1	0	1	0	38.09	38.087
40	27.405	211	17.995	17.9935	1	1	0	0	1	0	38.10	38.097

Note: 1. High Level = 4.5-5.5V
0. Low Level = 0.0-0.4V

CIRCUIT DESCRIPTION OF AM/SSB TRANSCEIVER

1. PLL CIRCUIT

The offset frequency oscillator Q3 oscillates 10.0525 MHz for AM and USB mode of operation (10.05175 MHz for LSB operation). This frequency output is, then, doubled in passing B.P.F. (T3) and applied to the IC 2, PIN No. 4 terminal to mix with the VCO output frequency being applied to the IC 2, PIN No. 2 terminal. The resultant sum frequency is obtained from IC 2, PIN No. 6 terminal and used as a first local frequency (37 MHz band). T1 and T2 are band pass filter for this frequency. While the difference frequency is amplified/buffered inside the IC 2 and the resultant frequency output (2.55–2.11 MHz) is led to the PLL IC 1 through IC 2, PIN No. 9.

Q4 is the switching circuit to shift the oscillating frequency of Q3 by 1.5 kHz for LSB operation. In terms of first local frequency 3 kHz will be shifted toward minus direction.

Q6 is the standard reference oscillator (10.240 MHz) and Q5 is the buffer amplifier for the oscillator.

Q7 is a switching transistor provided to cut off the RF Pre-amp, Q7, when the PLL IC 1 is out-of-locked, thus avoiding frequencies other than predetermined are amplified and radiated.

D6 is the diode through which DC voltage, which is supplied when the channel selector is placed between channels, is applied to the IC 3 to disable the mixing operation inside the IC 3. Thus no frequency will be generated though the channel selector is placed between correct channel positions.

Q2 is the buffer amplifier for RX local frequency, operating only in the receiver mode of operation.

For clearer understanding, please refer to the schematic diagram and the Block Diagram shown in Fig. 7.

2. AM RECEIVER CIRCUIT

A received signal passes T7, then amplified in Q20, and again passes the band pass filter consisting of T8 and T9, then, enters into the Mixer stage of Q22. On the other hand the first RX local signal frequency is applied to the base of Q22 through a coupling capacitor of C14. Then, both signals are mixed with inside the Q22 and converted into the first IF signal (10.695 MHz) in passing through the T10 and T13. The 10.695 MHz signal and 10.240 MHz signal generated in Q6 are applied to the balanced mixer consisting of D22 and D23 and 455 K Hz 2nd IF frequency will be made.
This frequency is then led to the T14, CF (ceramic filter), Q27, Q28, Q29 (amplified), T15 and finally led to the detector D25. The audio signal is then applied to the AF amplifier (IC5) through ANL (D26) circuit. The IC output drives the built-in speaker.
To improve signal over load distortion which would be caused when the receiver is subjected to a strong signal, three stages of AGC loops, each for Q20, Q22 and Q27, are provided.
Q21 is a switching transistor to short-circuit the primary circuit of T9 during transmit operation, thus disabling the receiver circuit. Refer to Fig. 8.

3. SSB RECEIVER CIRCUIT

An incoming signal induced on the antenna is led to the T7 and then to Q20 and amplified. The amplified output is applied to the Q22 mixer through a bandpass filter consisting of T8 and T9. While the first local frequency is being applied to the base of the same transistor, both frequencies are mixed with each other and first IF frequency will be made (10.695 MHz for AM/USB, 10.692 MHz for LSB).
This IF signal then amplified in passing through the T10, crystal filter, Q14, T11, Q16 and Q17 and finally detected into the audio signal with the product detector consisting of Q19. The audio signal is led to the Power IC (IC 5) to drive the built-in speaker.
Q18 is the transistor to avoid undesirable impulse noise, which would be generated in pressing the push-to talk switch, from entering into the AGC circuit.
To reduce the signal over load distortion in the SSB mode of operation, peak value type AGC circuitry consisting of Q30, and Q31 is employed for exclusive use of SSB operation.
Refer to the Block Diagram shown in Fig. 9.

4. AM TRANSMITTER CIRCUIT

The first local oscillator frequency (37 MHz band) and 10.695 MHz frequency generated in the Q12 are led to the PIN No. 4 and PIN No. 1 of IC 3, respectively, and mixed with each other, resulting in 27 MHz band transmit frequency. The 27 MHz output is led to the Q7 through T4 and T5, then led to the Q8, Q9 and Q10 in this order and amplified up to the high level necessary for transmission. Thus amplified Power output is applied to the Antenna Connector through a bandpass filter consisting of L11, L12, L13, etc.
On the other hand, the microphone input signal enters into the Power IC, (IC5, No. 6 PIN terminal) and amplified output is applied to the collectors of Q9 and Q10 through the transformer T16 and diode D43 to modulate the transmit carrier frequency.
Transistor Q35 is the automatic level controller provided to suppress the audio input level to the IC5 properly to avoid the over modulation. Q37 obtains its input signal from the audio output circuit through D43 and its output controls Q35, thus keeping modulation signal level to a relatively constant value.
Refer to the Block Diagram shown in Fig. 10.

5. SSB TRANSMITTER CIRCUIT

In the mode of SSB operation, either of first local oscillator frequency of 37.660 – 38.100 MHz (AM/USB) or 37.657 – 38.097 MHz (LSB) will be led to the IC3, No. 4 PIN terminal. On the other hand the 10.695 MHz (in LSB mode, this will be shifted to 10.692 MHz as previously mentioned) generated with Q12 is led to the balanced modulation IC (IC4). The IC is designed to produce carrier-suppressed double side band signals when an audio signal amplified with IC5 is applied to the PIN terminal of No. 1. Thus produced DSB signal will flow to Q13 and amplified, then led to the XF (crystal filter) to separate the desired side band.
The side band signal is led to the Q14 and amplified, then, the output is led to the No. 3 PIN terminal of IC3 and mixed with the first local oscillator signal to produce 27 MHz transmit signal. The 27 MHz SSB output is the led to the T4 and T5, then further led to the linear amplifiers, Q7, Q8, Q9 and Q10.
Thus amplified RF output is finally led to the antenna terminal through the bandpass and low pass networks provided between the Q10 and antenna connector.

To avoid over modulation distortion, an ALC circuitry consisting of Q35 and Q38 is provided in the SSB microphone amplifier circuit. Another ALC circuit is also employed in the RF circuit (from Q10 to IF Amp Q14) to reduce the distortion in the RF stages.
Transistor Q36 and Q39 are switching circuits to operate IC5 as an SSB microphone amplifier.
Refer to the Block Diagram shown in Fig. 11.

6. NOISE BLANKER CIRCUIT

An impulse signal included in the IF signals will be picked up through the capacitor C113 and applied to the D21. The rectified positive-half voltage is then applied to the transistors Q24 and Q25 and amplified to the enough level capable of turning the transistor Q26. The amplified impulse signal makes Q26 turn on while the impulse is being applied. In other word, the primary circuit of T10 is grounded to the chassis through C121 and the emitter-collector of Q26, so no mixer output will be obtained during this period. In this way the impulse noise will be blanked out.
D20 is the diode provided to control the bias voltage to the Q24 in according to the signal strength of the normal signals received, thus avoiding operation error which would be caused by the normal signals.
Refer to the Block Diagram shown in Fig. 8.

7. SQUELCH CIRCUIT

When AGC voltage lowers with a weak received signal, transistors Q32 and Q33 turn on and this makes Q34 turn off, controlling the bias voltage to the AF AMP (IC5) and disabling the amplifier. On the other hand when the transistor Q34 is turned on, the amplifier will start to operate.

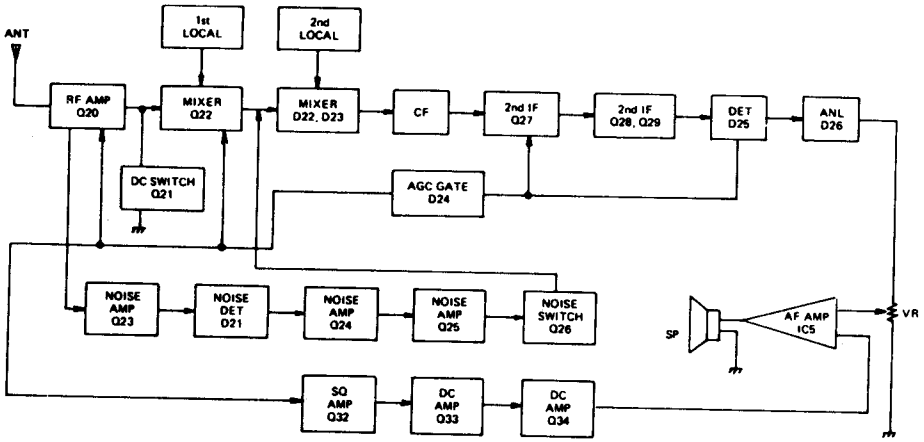
8. AVR (Automatic Voltage Regulator) CIRCUIT

This circuit consists of Q44 and D50 and supplies the regulated voltage through the switching transistors Q40, Q41, Q42 and Q43, depending upon the mode of operation.

9. REGULATED POWER SUPPLY CIRCUIT

The supplied 220 volts ac is stepped down by T201 and rectified by D1, 2, 3, and 4 to 13.8 volts dc. When the voltage between pin No. 3 and the chassis ground tends to decrease, the collector current of Q2 will decrease causing a decrease in the collector voltage. This will increase the bias of Q1 and Q201 and the voltage across the collector and emitter of Q201 will decrease thus restoring the initial output voltage drop.

SCHEMA A BLOCCHI DEL RICEVITORE AM



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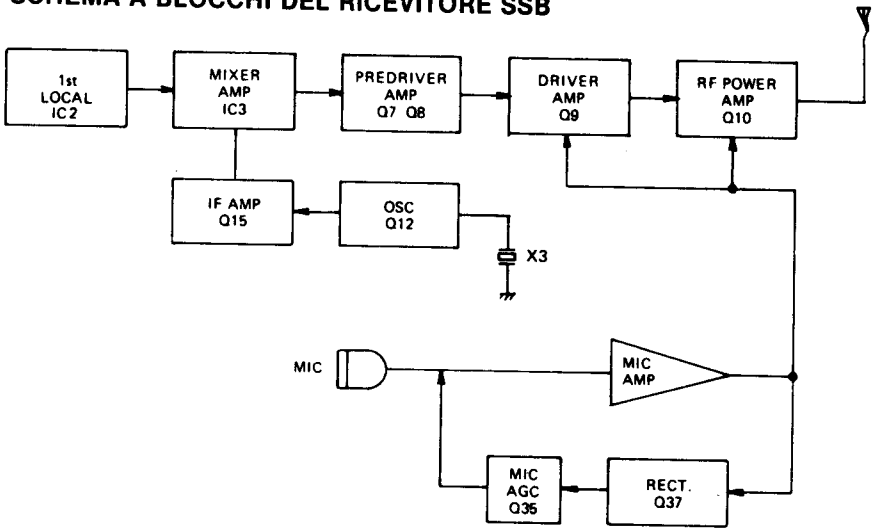

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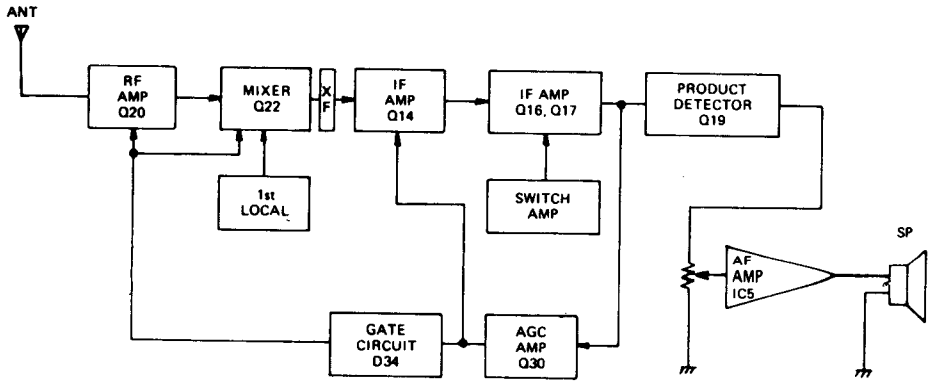

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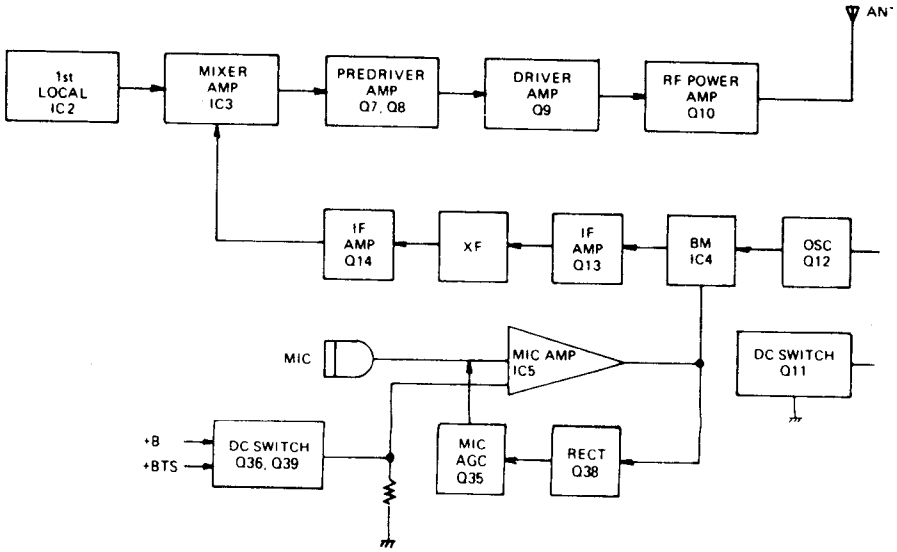

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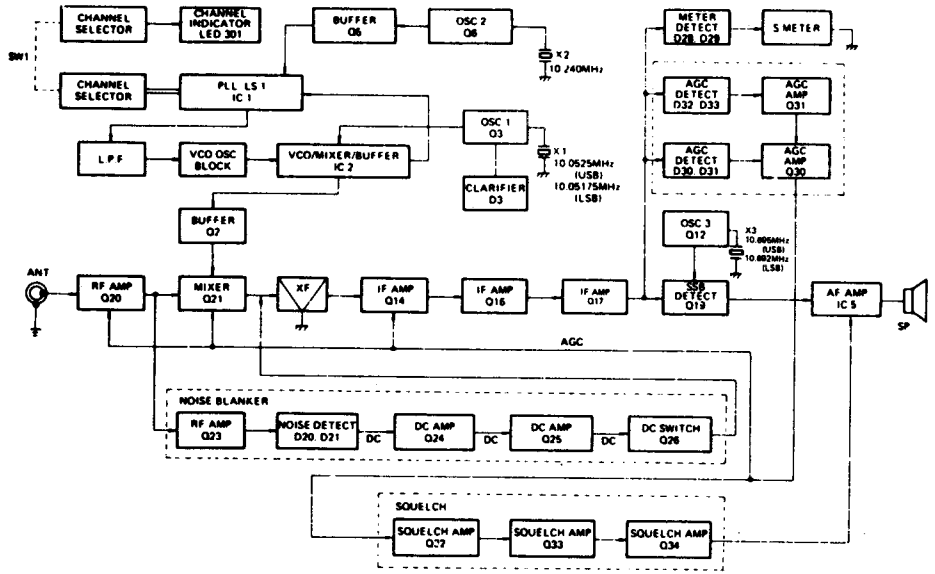
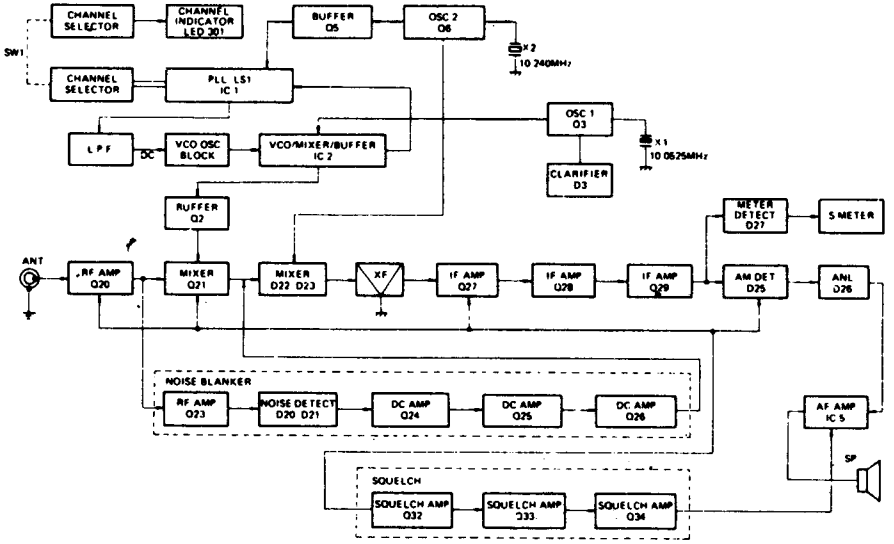


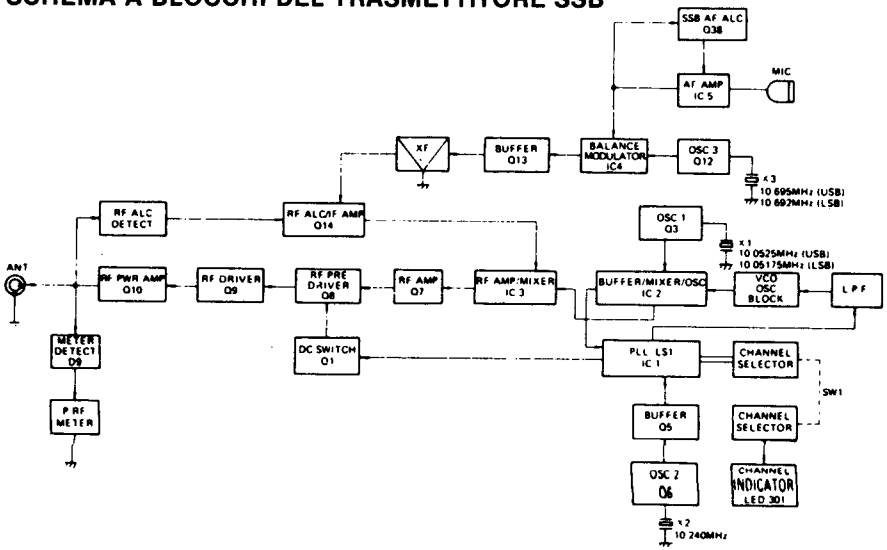
SSB RX

SCHEMA A BLOCCHI DEL RICEVITORE AM



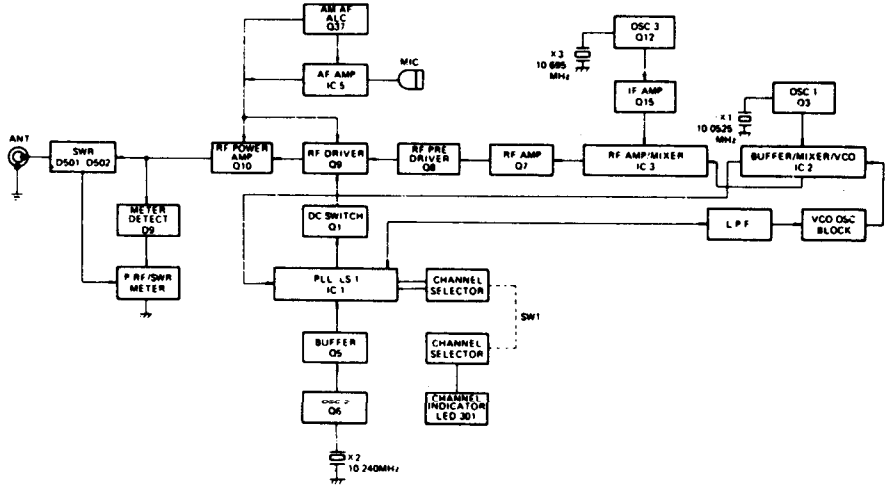
AM RX

SCHEMA A BLOCCHI DEL TRASMETTITORE SSB



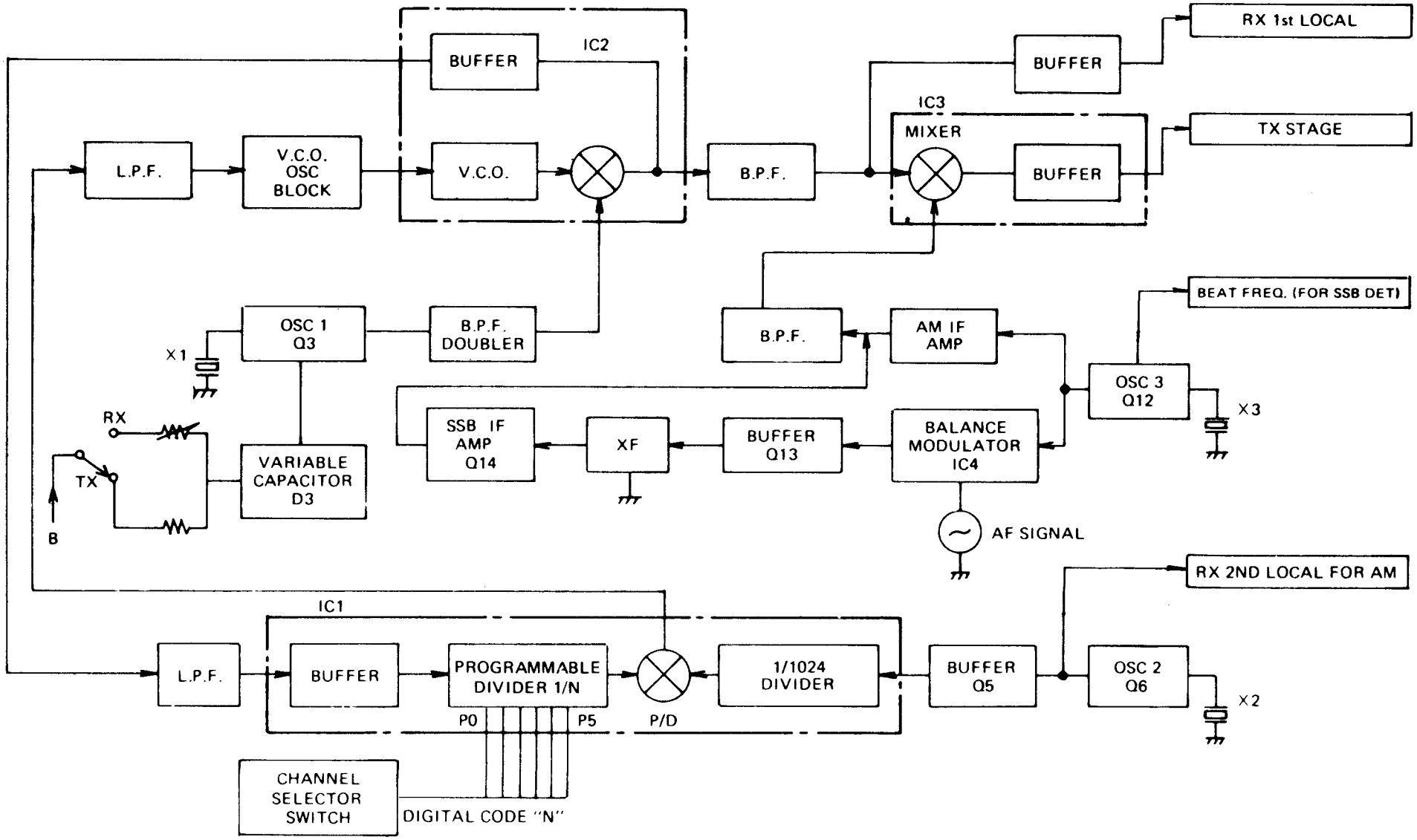
SSB TX

SCHEMA A BLOCCHI DEL TRASMETTITORE AM

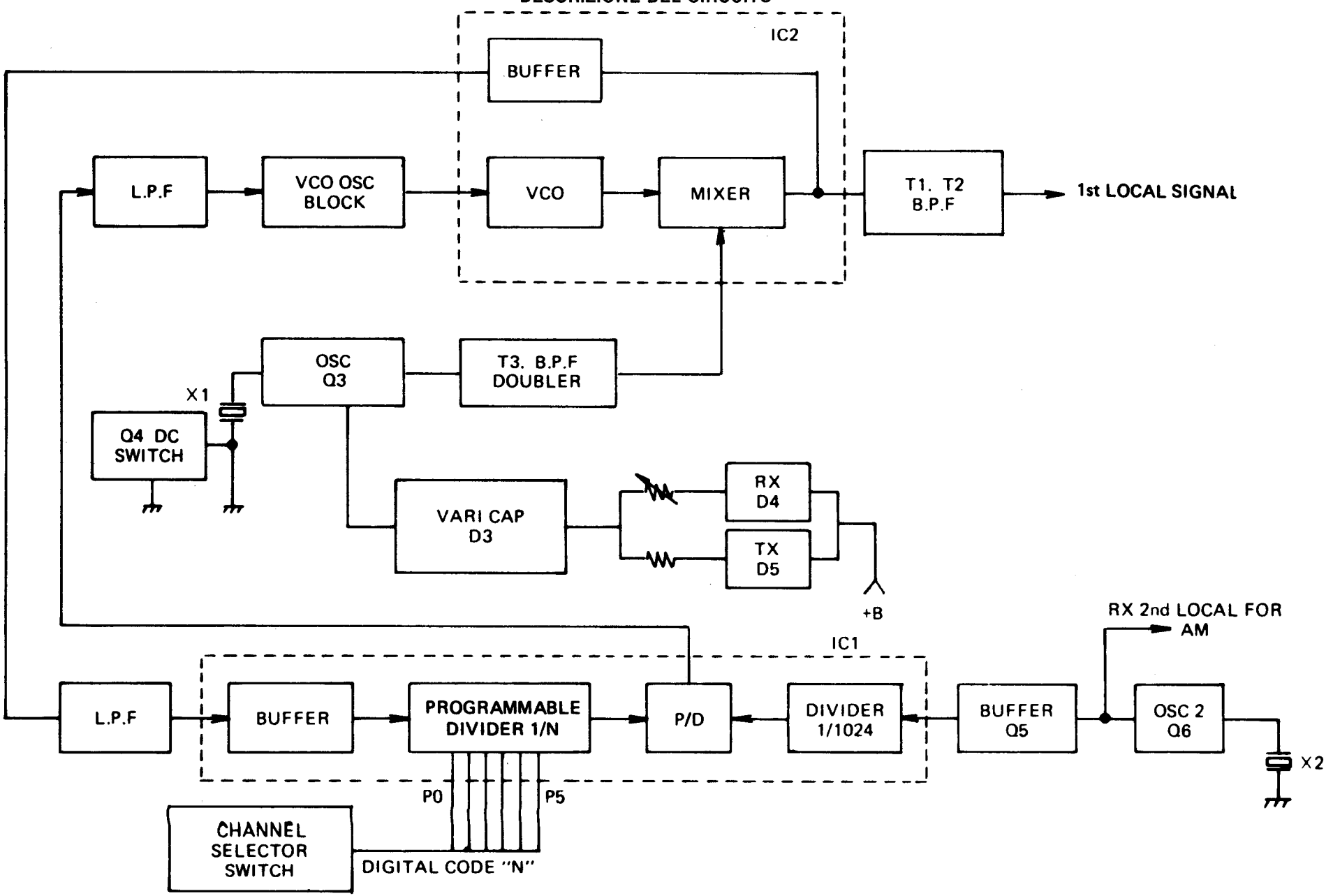


AM TX

CIRCUITO PLL



DESCRIZIONE DEL CIRCUITO



PROCEDURE DI ALLINEAMENTO

ALIGNMENT PROCEDURES FOR AM/SSB TRANSCEIVER

1. TEST VOLTAGE

DC 13.8V ± 5%, unless otherwise specified.

2. TEST EQUIPMENT

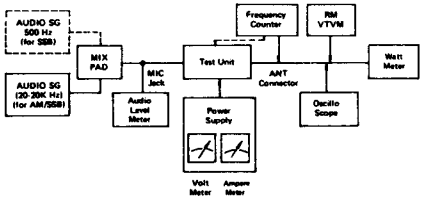
All test equipment should be properly calibrated.

1. Audio Signal Generator, 10 Hz to 20 kHz
2. Audio Level Meter, 1mV measurable
3. DC Ampere Meter, 3A
4. Regulated Power Supply, DC 0 to 20V, 3A or higher
5. Frequency Counter, 0 to 40 MHz, High Input Impedance Type
6. RF VTVM, Probe Type
7. Oscilloscope, 30 MHz, high input impedance
8. RF Watt Meter, thermo-couple type, 50 Ω, 15W
9. Standard Signal Generator, 100 kHz to 50 MHz, −10 to 100 dB, 50 Ω unbalanced
10. Speaker Dummy Resistor, 8 Ω, 5W
11. Circuit Tester, DC, 20 kΩ/V, High Input Impedance Type (20 kΩ/V or higher)

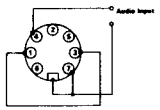
3. ALIGNMENT OF TRANSMITTER CIRCUITRY

3.1 Test Setup

Connect all test equipment as shown below:



3.2 To set the transceiver into transmit mode without the microphone, insert the plug wired as shown below into the MIC jack on the transceiver. When applying the audio modulation signal to the microphone input circuit, also use the same plug.



3.3 PLL Circuit Alignment

NOTE: This alignment should be conducted with the frequency counter having high sensitivity and high input impedance.

3.3.1 10.240 MHz Frequency Alignment (USB.TX)

Place the Channel Selector in CH19 and mode switch in USB position. Connect a frequency counter to the testpoint, TP2 through a 1000 pF Coupling capacitor and adjust the trimming capacitor CT3 for the reading of:

10.240000 MHz ± 50 Hz

3.3.2 10.0525 MHz Frequency Alignment (USB.TX)

Connect both oscilloscope and frequency counter to the test point TP3 and adjust the core of T3 maximum amplitude of scope display (10.0525 MHz x 2), then adjust the trimming capacitor CT1 to obtain the reading of:

20.105 MHz ± 40 Hz

Next, place the mode switch in the LSB position and adjust CT2 to obtain the reading of:

20.1035 MHz ± 40 Hz

3.3.3 10.695 MHz Frequency Alignment

Connect the frequency counter to the TP5 and adjust CT5 to read 10.695 MHz ± 50 Hz in the USB mode of operation. Next, place the mode switch in the LSB and adjust CT4 to read 10.692 MHz ± 50 Hz.

3.4 VCO Circuit Alignment

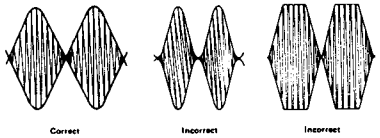
1. Place the channel selector in CH 1 position.
2. Connect a circuit tester (DC 12V range) between the ground and TP4.
3. Adjust core provided in the VCO Block to obtain 3.6V ± 0.1V, starting from top to bottom when turning the core (the circuit tester used in this alignment should be calibrated and has an input impedance of 20 kohm/V or higher).
4. Next, place the channel selector in CH 40 and make sure the reading should be within 1.4 - 2.3V.

3.5 Driver Stage Alignment

1. Apply 2.4 kHz, 2.5 mV audio signal to the MIC input circuit.
2. Place the channel selector in CH 40 position and mode switch in USB position.
3. Connect an oscilloscope and 50 ohm dummy load across the ANT connector.
4. Adjust T1 for maximum amplitude of scope display.
5. Next, place the channel selector in CH 1 position and adjust T2 for maximum amplitude.
6. Connect an ampere meter between the Q10 emitter and chassis ground and adjust RV1 to obtain bias current of 35 mA ± 10 mA.
7. Place the channel selector in CH 40 position and adjust T4 for maximum amplitude of scope display.
8. Place the channel selector in CH 1 position and adjust T5 for maximum amplitude.

3.6 SSB RF Power Amplifier Stage Alignment

1. Place the channel selector in CH 19 position and the mode switch in USB position.
2. Feed 2.4 kHz, 25 mV audio signal to the microphone input circuit.
3. Connect an oscilloscope to the Q7 emitter and adjust T11 for maximum amplitude of scope display.
4. Turn T6 core fully upward, then adjust RV11 to obtain the reading of 150 mV (peak-peak) on the scope.
5. Connect the oscilloscope to the ANT connector in parallel with the Watt-meter.
6. Temporarily adjust RV2 fully counter clockwise and adjust the L13 core so that the core top is flush with the top of coil bobbin.
7. Adjust T6, T11, L7 and L11 for maximum power output.
8. Decrease audio signal input to the microphone circuit to zero and adjust RV4 and RV5 for minimum amplitude of carrier leakage on the scope display.
9. Feed two tone (500 Hz and 2400 Hz) signals of 25 mV to the microphone circuit and adjust RV2 (ALC) to obtain PEP power of 10W. In this condition, make sure the PEP power output at each channel is within 9 - 11W. Also make sure the scope display of output wave shape shown below is obtained.



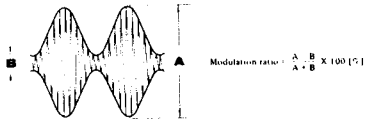
10. Place the mode switch in the LSB position and make sure the above alignments are not upset and the similar results are obtained in this mode of operation.

3.7 AM RF Power Stage Alignment

1. Place the mode switch in the AM position and the channel selector in CH 19 position.
2. Adjust VR4 for RF power output of 3.7W on the Wattmeter.

3.8 Modulation Alignment (AM)

1. Apply 2.5 kHz, 25 mV Audio input signal to the MIC input circuit.
2. Adjust RV12 so that modulation depth of 80 - 90% is obtained.
3. Next, decrease the signal input to 2.5 mV and make sure the modulation depth is still keeping 30% or higher.



3.9 RF Power Meter Alignment (AM)

Adjust RV3 so that the P.RF meter provided on the front panel should indicate the same wattage as the one obtained on the Watt-meter.

3.10 Lock Out Circuit Check

Place the channel selector in the open (blank) channel (detent) position. Make sure the voltage at Q1 base is 0.05 – 0.4V, using a circuit tester.

3.11 Transmit Frequency Check

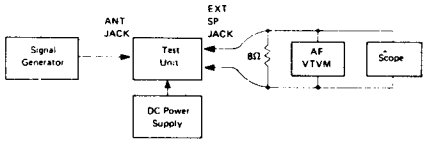
1. Set the transceiver into transmit mode (AM), no modulation.
2. Connect the frequency counter to the antenna connector. And read the frequency at each channel. The frequency should be within ±800 Hz from each center channel frequency as tabulated in the Frequency Table attached.

3.12 Alignment of Regulated Voltage Power Supply

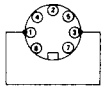
Make sure the voltage at PIN Terminal No. 3 on PTPW007COX is 13.8V with AC voltage of 220V supplied. If not, adjust RV 1 to obtain that voltage.

4. ALIGNMENT OF RECEIVER CIRCUITRY

4. 1 Test-Setup



4. 2 To make the transceiver into receive mode, insert the plug wired as shown below into the MIC jack on the front panel.



4.3 AGC Alignment

1. Connect the circuit tester to the No. 15 terminal on the P.C. board and chassis ground.
2. Rotate RF Gain control fully clockwise.
3. Place the mode switch in the AM position.
4. Adjust RV8 to obtain the reading of 2V.

4. 4 Receive Sensitivity Alignment (AM Mode)

1. Set the Signal Generator, 27.185 MHz, 1 kHz 30% modulation. Also set the transceiver into 19 channel position.
2. Adjust T7, T8, T9, T10, T13, T14 and T15 for maximum audio output between the 8 ohm dummy load resistor. This alignment should be performed with very small signal input from the signal generator to avoid inaccurate alignment due to AGC action.
3. After completion of the step 3, rotate the T7 core, so that the audio output decreases by 2 dB.

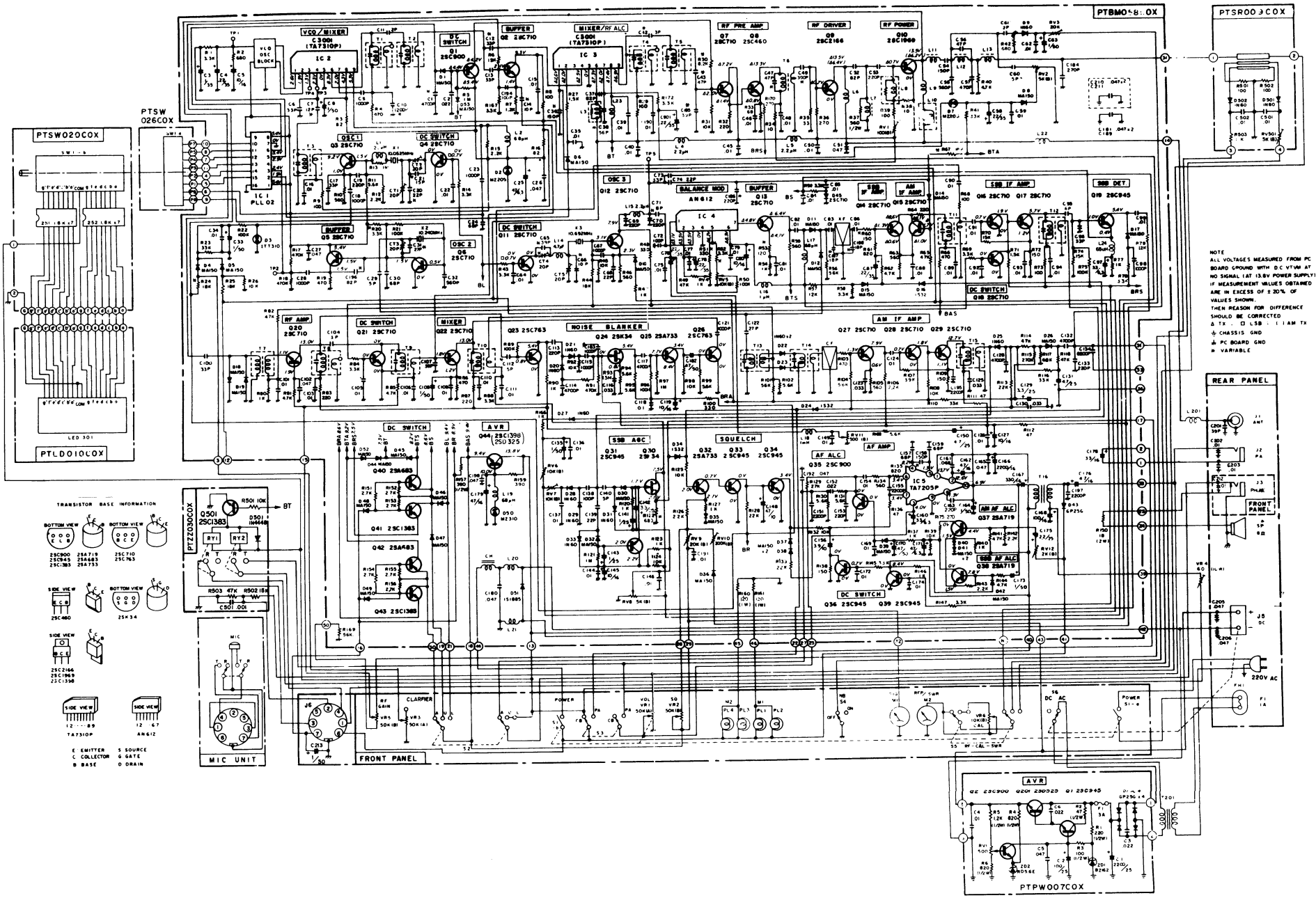
NOTE: Throughout the above alignment, place the RF Gain control in fully clockwise position, CB-PA switch in CB, Squelch control in minimum and Clarifier control in "12 o'clock" position.

4. 5 Squelch Circuit Alignment

1. Place the mode switch in AM position.
2. Set the signal generator to provide RF input signal of 28 dB (1 kHz, 30% mod.) and rotate the squelch control in full clockwise position.
3. Adjust RV9 so that the audio output just appears on the output terminal (scope-display).
4. Next, place the mode switch in USB position and adjust RV10 in the similar way.

4. 6 S-Meter Adjustment

1. Set the signal generator to provide 40 dB output and place the mode switch in the USB position.
2. Adjust RV7 so that the S-meter pointer should read "9" on the meter provided on the front panel.
3. Next, place the mode switch in the AM position and retune the signal generator slightly to obtain maximum audio output.
4. Adjust RV6 so that the S-meter pointer should read "9" on the meter


PTBM0480X
PTSR003COX
PTSW020COX
PTSW026COX
PTLD010COX
PTZ030COX
PTPW007COX
VCO/MIXER
IC 2
IC 3
IC 4
IC 5 TA7205P
IC 1 PLL02
BUFFER
MIXER/RF ALC
RF PRE AMP
RF DRIVER
RF POWER
DC SWITCH
OSC 1
OSC 2
OSC 3
BALANCE MOD
AM IF AMP
SSB IF AMP
SSB DET
RF AMP
MIXER
NOISE BLANKER
AM IF AMP
SSB AGC
SQUELCH
AF AMP
AF ALC
AM RF ALC
SSB AF ALC
AVR
TRANSISTOR BASE INFORMATION
TA7310P
AN612
MIC UNIT
FRONT PANEL
REAR PANEL
NOTE
ALL VOLTAGES MEASURED FROM PC BOARD GROUND WITH D.C VTVM AT NO SIGNAL (AT 13.8V POWER SUPPLY)
IF MEASUREMENT VALUES OBTAINED ARE IN EXCESS OF ± 20% OF VALUES SHOWN,
THEN REASON FOR DIFFERENCE SHOULD BE CORRECTED
△ TX . □ LSB . ○ AM TX
⏚ CHASSIS GND
⏚ PC BOARD GND
⊕ VARIABLE
220V AC